

What is claimed is:

1 1. A color image processing apparatus comprising:

2 object color designating means for designating an object
3 color to be converted in an input color image;

4 optimum color setting means for setting an optimum color
5 corresponding to said object color designated by said object
6 color designating means;

7 lightness conversion factor obtaining means for
8 obtaining a lightness conversion factor based on said object
9 color and said optimum color; and

10 lightness converting means for converting the input color
11 image in lightness using said lightness conversion factor to
12 create a lightness-changed color image.

1 2. A color image processing apparatus according to claim

2 1, wherein:

3 said lightness converting means converts said object
4 color in lightness using said lightness conversion factor to
5 create a lightness-changed object color; and

6 said apparatus further comprises hue and chroma
7 converting means for converting said lightness-changed color
8 image in hue and chroma based on a color difference between said
9 lightness-changed object color and said optimum color.

1 3. A color image processing apparatus according to claim

2 1, wherein:

3 said object color designating means designates a
4 plurality of object colors;

5 said optimum color setting means sets a plurality of
6 optimum colors respectively corresponding to the plural object
7 colors; and

8 said lightness conversion factor obtaining means obtains
9 a plurality of individual lightness conversion factors
10 respectively corresponding to said plural object colors and
11 said plural optimum colors, and also obtains an average
12 weighting value of said plural individual lightness conversion
13 factors as said lightness conversion factor, using weighting
14 factors respectively corresponding to said plural optimum
15 colors.

1 4. A color image processing apparatus according to claim
2 2, wherein:

3 said object color designating means designates a
4 plurality of object colors;

5 said optimum color setting means sets a plurality of
6 optimum colors respectively corresponding to the plural object
7 colors; and

8 said lightness conversion factor obtaining means obtains
9 a plurality of individual lightness conversion factors
10 respectively corresponding to said plural object colors and
11 said plural optimum colors, and also obtains an average
12 weighting value of said plural individual lightness conversion
13 factors as said lightness conversion factor, using weighting

14 factors respectively corresponding said plural optimum colors.

1 5. A color image processing apparatus according to claim
2 1, wherein:

3 said apparatus further comprises an optimum color
4 database previously retaining color values of various optimum
5 colors; and

6 said optimum color setting means sets said optimum color
7 corresponding to said object color as selected from said optimum
8 color database.

1 6. A color image processing apparatus according to claim
2 2, wherein:

3 said apparatus further comprises an optimum color
4 database previously retaining color values of various optimum
5 colors; and

6 said optimum color setting means sets said optimum color
7 corresponding to said object color as selected from said optimum
8 color database.

1 7. A color image processing apparatus according to claim
2 3, wherein:

3 said apparatus further comprises an optimum color
4 database previously retaining color values of various optimum
5 colors and also weighting factors corresponding to the
6 individual optimum colors;

7 said optimum color setting means sets more than one

8 optimum colors respectively corresponding to said plural object
9 colors as selected from said optimum color database; and
10 said lightness conversion factor obtaining means reads
11 out more than one weighting factors corresponding to the
12 individual optimum colors from said optimum color database.

1 8. A color image processing apparatus according to claim
2 4, wherein:

3 said apparatus further comprises an optimum color
4 database previously retaining color values of various optimum
5 colors and also weighting factors corresponding to the
6 individual optimum colors;

7 said optimum color setting means sets more than one
8 optimum colors respectively corresponding to said plural object
9 colors as selected from said optimum color database; and

10 said lightness conversion factor obtaining means reads
11 out more than one weighting factors corresponding to the
12 individual optimum colors from said optimum color database.

1 9. A computer-readable recording medium in which a color
2 image processing program is recorded, wherein said color image
3 processing program instructs a computer to function as the
4 following:

5 object color designating means for designating an object
6 color to be converted in an input color image;

7 optimum color setting means for setting an optimum color
8 corresponding to said object color designated by said object

9 color designating means;
10 lightness conversion factor obtaining means for
11 obtaining a lightness conversion factor based on said object
12 color and said optimum color; and
13 lightness converting means for converting the input
14 color image in lightness using said lightness conversion factor
15 to create a lightness-changed color image.

1 10. A computer-readable recording medium according to
2 claim 9, wherein:

3 said color image program said lightness converting means
4 converts said object color in lightness using said lightness
5 conversion factor to create a lightness-
6 changed object color; and

7 said color processing program further instructs the
8 computer to function as hue and chroma conversion means for
9 converting said lightness-changed color image in hue and chroma
10 based on a color difference between said lightness-changed
11 object color and said optimum color.

1 11. A computer-readable recording medium according to
2 claim 9, wherein:

3 said object color designating means designates a
4 plurality of object colors;

5 said optimum color setting means sets a plurality of
6 optimum colors respectively corresponding to the plural object
7 colors; and

8 said lightness conversion factor obtaining means obtains
9 a plurality of individual lightness conversion factors
10 respectively corresponding to said plural object colors and
11 said plural optimum colors, and also obtains an average
12 weighting value of said plural individual lightness conversion
13 factors as said lightness conversion factor, using weighting
14 factors respectively corresponding to said plural optimum
15 colors.

1 12. A computer-readable recording medium according to
2 claim 10, wherein:

3 said object color designating means designates a
4 plurality of object colors;

5 said optimum color setting means sets a plurality of
6 optimum colors respectively corresponding to the plural object
7 colors; and

8 said lightness conversion factor obtaining means obtains
9 a plurality of individual lightness conversion factors
10 respectively corresponding to said plural object colors and
11 said plural optimum colors, and also obtains an average
12 weighting value of said plural individual lightness conversion
13 factors as said lightness conversion factor, using weighting
14 factors respectively corresponding to said plural optimum
15 colors.

1 13. A color image processing method comprising the steps
2 of:

3 (a) designating an object color to be converted in an
4 input color image;

5 (b) setting an optimum color corresponding to said object
6 color designated by said designating step (a);

7 (c) obtaining a lightness conversion factor based on said
8 object color and said optimum color; and

9 (d) converting the input color image in lightness using
10 said lightness conversion factor to create a lightness-changed
11 color image.

1 14. A color image processing method according to claim
2 13, wherein:

3 in said lightness converting step (d), said object color
4 is converted in lightness, using said lightness conversion
5 factor, to create a lightness-changed object color; and

6 said method further comprises a step of converting said
7 lightness-changed color image in hue and chroma based on a color
8 difference between said lightness-
9 changed object color and said optimum color.

1 15. A color image processing method according to claim
2 13, wherein:

3 in said object color designating step (a), a plurality
4 of object colors are designated;

5 in said optimum color setting step (b), a plurality of
6 optimum colors respectively corresponding to the plural object
7 colors are set; and

8 in said lightness conversion factor obtaining step (c),
9 a plurality of individual lightness conversion factors
10 respectively corresponding to said plural object colors and
11 said plural optimum colors are obtained, and then an average
12 weighting value of said plural individual lightness conversion
13 factors is obtained as said lightness conversion factor using
14 weighting factors respectively corresponding to said plural
15 optimum colors.

1 16. A color image processing method according to claim
2 14, wherein:

3 in said object color designating step (a), a plurality
4 of object colors are designated;

5 in said optimum color setting step (b), a plurality of
6 optimum colors respectively corresponding to the plural object
7 colors are set; and

8 in said lightness conversion factor obtaining step (c),
9 a plurality of individual lightness conversion factors
10 respectively corresponding to said plural object colors and
11 said plural optimum colors are obtained, and then an average
12 weighting value of said plural individual lightness conversion
13 factors is obtained as said lightness conversion factor using
14 weighting factors respectively corresponding to said plural
15 optimum colors.

1 17. A color image processing apparatus comprising:
2 object color designating means for designating an object

3 color to be converted in an input color image;

4 optimum color setting means for setting an optimum color
5 corresponding to said object color designated by said object
6 color designating means;

7 preliminary lightness conversion amount obtaining means
8 for obtaining a preliminary lightness conversion amount in
9 accordance with a differential value in lightness between said
10 object color and said optimum color;

11 practical lightness conversion amount obtaining means
12 for obtaining a practical lightness conversion amount by
13 compensating said preliminary lightness conversion amount so
14 as to decrease said preliminary lightness conversion amount
15 commensurate with the largeness of said preliminary lightness
16 conversion amount;

17 lightness conversion factor obtaining means for
18 obtaining a lightness conversion factor based on said practical
19 lightness conversion amount, said object color and said optimum
20 color; and

21 lightness converting means for converting the input color
22 image in lightness using said lightness conversion factor to
23 create a lightness-changed color image.

1 18. A color image processing apparatus according to
2 claim 17, wherein said practical lightness conversion amount
3 obtaining means obtains said lightness conversion amount such
4 as to approximate a predetermined value as said preliminary
5 lightness conversion amount increases.

1 19. A color image processing apparatus according to
2 claim 17, further comprising preliminary lightness converting
3 means for preliminarily converting the input color image in
4 lightness, based on a histogram or a maximum/minimum/average
5 value of pixel information in the input color image, to create
6 a preliminary amended-lightness color image as the color image.

1 20. A color image processing apparatus according to
2 claim 18, further comprising preliminary lightness converting
3 means for preliminarily converting the input color image in
4 lightness, based on a histogram or a maximum/minimum/average
5 value of pixel information in the input color image, to create
6 a preliminary amended-lightness color image as the color image.

1 21. A computer-readable recording medium in which a
2 color image processing program is recorded, wherein said color
3 image processing program instructs a computer to function as
4 the following:

5 object color designating means for designating an object
6 color to be converted in an input color image;

7 optimum color setting means for setting an optimum color
8 corresponding to said object color designated by said object
9 color designating means;

10 preliminary lightness conversion amount obtaining means
11 for obtaining a preliminary lightness conversion amount in
12 accordance with a differential value in lightness between said

13 object color and said optimum color;

14 practical lightness conversion amount obtaining means
15 for obtaining a practical lightness conversion amount by
16 compensating said preliminary lightness conversion amount so
17 as to decrease said preliminary lightness conversion amount
18 commensurate with the largeness of said preliminary lightness
19 conversion amount;

20 lightness conversion factor obtaining means for
21 obtaining a lightness conversion factor based on said practical
22 lightness conversion amount, said object color and said optimum
23 color; and

24 lightness converting means for converting the input color
25 image in lightness using said lightness conversion factor to
26 create a lightness-changed color image.

1 22. A computer-readable recording medium according to
2 claim 21, wherein said practical lightness conversion amount
3 obtaining means obtains said lightness conversion amount such
4 as to approximate a predetermined value as said preliminary
5 lightness conversion amount increases.

1 23. A computer-readable recording medium according to
2 claim 21, wherein said color processing program further
3 instructs the computer to function as preliminary lightness
4 converting means for preliminarily converting the input color
5 image in lightness, based on a histogram or a
6 maximum/minimum/average value of pixel information in the input

7 color image, to create a preliminary amended-lightness color
8 image as the color image.

1 24. A computer-readable recording medium according to
2 claim 22, wherein said color processing program further
3 instructs the computer to function as preliminary lightness
4 converting means for preliminarily converting the input color
5 image in lightness, based on a histogram or a
6 maximum/minimum/average value of pixel information in the input
7 color image, to create a preliminary amended-lightness color
8 image as the color image.

1 25. A color image processing method comprising the steps
2 of:

3 (a) designating an object color to be converted in an
4 input color image;

5 (b) setting an optimum color corresponding to said object
6 color designated by said designating step (a);

7 (c) obtaining a preliminary lightness conversion amount
8 in accordance with a differential value in lightness between
9 said object color and said optimum color;

10 (d) obtaining a practical lightness conversion amount by
11 compensating said preliminary lightness conversion amount so
12 as to decrease said preliminary lightness conversion amount
13 commensurate with the largeness of said preliminary lightness
14 conversion amount;

15 (e) obtaining a lightness conversion factor based on said

16 practical lightness conversion amount, said object color and
17 said optimum color; and
18 (f) converting the input color image in lightness using
19 said lightness conversion factor to create a lightness-changed
20 color image.

1 26. A color image processing method according to claim
2 25, wherein in said practical lightness conversion amount
3 obtaining step (d), said lightness conversion amount such as
4 to approximate a predetermined value is obtained as said
5 preliminary lightness conversion amount increases.

1 27. A color image processing method according to claim
2 25, further comprising a step of preliminarily converting the
3 input color image in lightness, based on a histogram or a
4 maximum/minimum/average value of pixel information in the input
5 color image, to create a preliminary amended-lightness color
6 image as the color image.

1 28. A color image processing method according to claim
2 26, further comprising a step of preliminarily converting the
3 input color image in lightness, based on a histogram or a
4 maximum/minimum/average value of pixel information in the input
5 color image, to create a preliminary amended-lightness color
6 image as the color image.